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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/058,021	01/29/2002	Takaei Kitagawa	D-1215	2668
7590 06/10/2004				
Hauptman Kanesaka Berner Patent Agents, L.L.P. 1700 Diagonal Road Suite 310 Alexandria, VA 22314		EXAMINER CYGAN, MICHAEL T		
		ART UNIT 2855 PAPER NUMBER		

DATE MAILED: 06/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/058,021

**Applicant(s)**KITAGAWA, TAKAEI **Examiner**

Michael Cygan

**Art Unit**

2855

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 4-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1 and 4-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over O'Dougherty (US 5,924,794) in view of Allington (US 3,398,689).  
O'Dougherty teaches mixing two different liquids (a concentrate and a diluent) having a predetermined mixing ratio (i.e., a desired concentration of the concentrate in the diluent) by setting and changing a switching timing (amount of time the associated valves are opened); see column 12, lines 34-39 for concentrate and column 13, lines 7-12 for diluent. The concentrate and diluent are alternately and sequentially sucked into pump chamber 26 as shown in Figures 1 and 5 (steps 224 and 226; the procedure of adding concentrate and/or diluent is repeated as specified at column 12, lines 50-54).

O'Dougherty further teaches determining an actual mixing ratio with sensors and analyzers [34,45], calculating mixing ratio errors as the difference between predicted and actual ratios ("Injection Constant" for both Concentrate and Diluent ), storing the updated constant in memory [44] as shown in Figure 2, which is used to correct the switching timing for future, practical operations. The valves are sequentially operated as shown in Figure 5A (steps [200,205]). Note for example column 13, lines 5-11, and also lines 18-45.

Apparatus for performing the above method is disclosed, including switch valves [32,156], pump [26], mix tank [12], detectors [34,36], calculation microprocessor [42], memory [44], and correction portion [40] connected to calculation portion and switch valves and memory portion. The gradient function is considered to be at "low" pressure. See entire document, especially column 5, lines 3-52; column 7 line 29 through column 8 line 24; column 10 line 47 through column 11 line 42; column 12, line 64 through column 13, line 46.

O'Dougherty teaches the claimed invention except application to a liquid chromatograph having a column and utilizing density gradients as well as a pump including a pump chamber having plunger, cam, motor, and position sensor. Allington teaches an apparatus for mixing two liquids and transferring the mixture to a detector which is applied to a liquid chromatograph having a column and utilizing density gradients as well as

a pump including a pump chamber having plunger [56,57,72] in a pump chamber, cam [78], motor [19], and position sensor [springs 67,73]; (see column 2, lines 9-31; column 4, line 67 through column 6, line 46; and column 6 line 68 through 7, line 45).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a liquid chromatograph having a column and utilizing density gradients as well as a pump including a pump chamber having plunger, cam, motor, and position sensor in the invention taught by O'Dougherty to act as the controlled system, since Allington teaches that a pump including a pump chamber having plunger, cam, motor, and position sensor provides a practically constant flow of liquid (which is beneficial for the ability to produce a desired concentration through valve switching in the invention taught by O'Dougherty), and that a liquid chromatograph in which the column is attached to a components detector requires a specified variation of relative concentration with respect to the amount of liquid pumped for density gradients measurements, and therefore would provide a beneficial application for the mixing device taught by O'Dougherty.

### ***Response to Arguments***

2. Applicant's arguments filed 10 November 2003 have been fully considered but they are not persuasive. Applicant argues that two different liquids are

not alternately sucked into a single pump; however, note that the pump set forth in the rejection is pump 26, not pump 60 or pump 32 as argued at page 2 of the response. (Note that 60 and 32 are valves rather than pumps). As shown in Figure 5 and set forth in the previous Office Action, the concentrate and diluent are alternately and sequentially sucked into pump chamber 26 as shown in Figures 1 and 5 (steps 224 and 226; the procedure of adding concentrate and/or diluent is repeated as specified at column 12, lines 50-54).

3. Applicant further argues that the ratio error is not based on the error caused by the pumps; however, the invention of O'Dougherty creates an error based upon measured fluid composition, and would be responsive to any apparatus error (including pump error) which would cause the composition to deviate from the desired ratio.
4. With respect to arguments against the combination of references, the applied teaching of Allington is the use of a certain type of pump (a pump including a pump chamber having plunger [56,57,72] in a pump chamber, cam [78], motor [19], and position sensor [springs 67,73] as set forth in the previous Office Action) to act as the pump 26 in the system taught by O'Dougherty. A single pump is being taught to replace a single pump; at no point in the rejection are two pumps being used.

5. With respect to the arguments at pages 4-5 of the response against the rejection of claim 4, it is first noted that at no point in claim 4 is "the plunger connected to the switch valves" recited; rather, the liquids are transferred "to the pump chamber alternately through the switch valve", which is made obvious by using the pump taught by Allington in the system of O'Dougherty as set forth in the rejection of the previous Office Action.
6. With respect to the correction of switching timing for future practical runs, the procedure of adding concentrate and/or diluent is repeated as specified at column 12, lines 50-54; mixing ratio errors are calculated as the difference between predicted and actual ratios ("Injection Constant" for both Concentrate and Diluent ); and the updated constant is stored in memory [44] as shown in Figure 2, which is used to correct the switching timing for future, practical operations.

### ***Conclusion***

7. All claims are drawn to the same invention claimed in the application prior to the entry of the submission under 37 CFR 1.114 and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the application prior to entry under 37 CFR 1.114.  
Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action after the filing of a request for continued examination and the submission

under 37 CFR 1.114. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

8. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cygan whose telephone number is (571) 272-2175. The examiner can normally be reached on 8:30-6 M-Th, alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on 571-272-2180. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.



Art Unit: 2855

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Michael Cygan', with a stylized, circular flourish at the end.

MICHAEL CYGAN  
PRIMACY EXAMINER